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ABSTRACT

The Physical Diagnosis Slide Bank, a collaborative project of the Universities of Washington, California at San Diego, and Arizona, utilizes an online interactive computer program to access a collection of over 2000 teaching clinical slides. Searchable data elements for each slide in the bank include subject descriptors (MeSH); accession number; contributing physician; date of entry; and slide type, e.g., x-ray, histopathological. The most common search approach is by subject with each slide being assigned at least three descriptors, one each for physical finding, anatomical part, and etiology. Many users interact directly with the system, previewing and selecting available slides for use and duplication. If they are not familiar with MeSH, user instruction is available. Sample Slide Bank data entry forms, a patient consent form, and several forms used in coordination with user slide selection are appended.
(Author/MBR)

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ON-LINE RETRIEVAL OF CLINICAL SLIDES

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ON-LINE RETRIEVAL OF CLINICAL SLIDES

The description, organization and retrieval of individual 35 mm clinical slides have long been problems for libraries, media centers, hospitals, faculty and others. Yet, a demonstrated need exists for high-quality visuals to supplement the teaching of physical diagnosis and clinical medicine. The need has become more acute as numbers of patients with advanced physical abnormalities have declined. This has led to greater exploitation of patients who do present with classic findings and to increased claims of territoriality ("No, I cannot share my photographs!") by those who do have such slides.

In an attempt to deal with these problems, the University of Washington, the University of California at San Diego, and the University of Arizona decided to collaborate and establish a Physical Diagnosis Slide Bank. This presentation concerns our attempt to organize a collection of 2,000 slides of physical findings; to classify and encode them; to establish an on-line, interactive computer retrieval program; and to produce and distribute color microfiche subject catalogs.

Development of Bank of Visuals:

Since March, 1977, we have collected over 2,000 high-quality slide masters. Currently campaigning to increase "donations" of slide masters, we have arranged to cover the photography charge and to give contributing faculty members a free duplicate of any master he or she gives to the bank.

This new policy should greatly increase acquisitions. We hope to soon have a broad-based collection of classic findings -- not the obscure and rare, but rather the common visuals often needed for lectures, self-paced instruction, and teaching sets.

Technical Processing:

All slides collected at the three universities come to the slide bank for classification and assignment of descriptors. The contributor (generally a physician) is responsible for obtaining patient consent which includes permission for duplication and distribution.

In addition, the contributor provides diagnostic information to the cataloger. These data are contained in the processing form (Figure 1).

The cataloger uses this form to generate the unit record. On a sample record (Figure 2) one can identify the following elements: accession numbers, number of slides in set, contributor, date of entry, slide type, and subject descriptors.

The structure of initial requests for slides was used as the basis for the structure of the unit record. We found that by far the most common form of request was for slides of a given subject. For this reason, we studied several options for the descriptor area.

We chose the A (anatomical terms) and C (diseases) of MeSH as our vocabulary for the following four reasons:

1. We can use the hierarchial tree structures as our subject file. This allows some flexibility in searching, since the program will automatically retrieve slides cataloged by terms more specific than that selected as a searching term.
2. Our users, who are primarily in academic settings, are quite familiar with MeSH via Index Medicus and Medline and can use the same term to search for slides in our bank as they do in interacting with these other systems.
3. We can rely on NLM to annually update the vocabulary.
4. Despite frequent user disagreement about specific terms, MeSH is a national standard with good coverage of the physical diagnosis area.

We have found that three MeSH terms are generally required to describe a given slide, one each for physical finding, anatomical part and etiology. We have been as specific as possible in assigning descriptors since, as explained, the program "explodes" terms automatically. In a few cases there is just no MeSH equivalent for a particular term. In these cases we have used the non-MeSH term preceded by an asterisk. We cannot presently search this free word file, but the term always appears in the description of the slide.

Retrieval System

The computer program is as self-explanatory as possible. In general, the user can interact directly with the program. Figure 3 shows the initial display after logging in. The user selects his approach to the file (search strategy) and receives further instructions (Figure 4). In this sample, the user requested slides "by subject." Unless otherwise directed, this program will perform a logical "and" operation (i.e., we will only retrieve slides described by both dermatitis and arm, although both terms will be exploded). In Figure 5, the computer responds with the number of slides which match our request. It then offers a variety of displays of the results of the search. Most often the user will want a full description of these slides, as shown in Figure 6. Notice that eczema of the hand was retrieved because eczema appears in the trees under dermatitis, and hand under arm.

The slides themselves are stored by acquisition number in plastic sheets in three-ring binders located on a shelf above the terminal. As slide citations are retrieved, the user pulls the appropriate slides from the binder and views them on an adjacent light box. He may then order duplicates of any slide he wishes. Duplication generally takes three days.

Sharing the Data Base:

We are experimenting with two different methods of sharing the file information. All processing, data entry and updating is consolidated at the University of Washington. The two other participating universities access the slide bank records at or from their institutions. The University of California at San Diego does not have compatible hardware; therefore, at this time they are using our file via long distance telephone hookup. The major expense for this is the telephone call. The University of Arizona does have compatible computer hardware. In this case, the University of Arizona has a duplicate computer tape and can run the slide bank program at their campus off their computer. Each university maintains a complete set of slides in the bank. We will monitor and compare usage at the different sites over the next few months and will attempt to draw some conclusions regarding implications of the various means of access.

Slide Review and Evaluation:

Each schoool originally screened its own contributions and the bank retained all slides of acceptable quality. Although this helped build the collection of slides, it resulted in uneven coverage of many subject areas. In view of this problem, staff of the participating schools met in the spring to review acquisition policy and to evaluate the teaching value of each slide. Each slide was rated on a 1-5 scale by a representative of each of the three universities. The slides were presented in subject groups with no indication of source (i.e., the university of

origin). Approximately two-thirds of the slides passed the screening (3.67 on the 1-5 scale). Only these screened slides will be distributed by the bank. Another product of the review meeting was a "dream list" of subjects for which we do not currently have acceptable slides. The clinical photographers will receive a copy of the list and a special effort will be made to locate the slides. We anticipate that these slide reviews will take place at least twice per year.

Catalog Production and Distribution:

A computer-generated printout of the subject file (that portion of the MeSH Tree Structures for which we have acceptable slides) with an alphabetic index will form the subject catalog of the slide bank. Since no written description is ever a satisfactory substitute for a visual image, slides illustrating each subject area will be converted to color microfiche. The product will be a visual catalog of the bank which includes the actual images of the collection. We have made similar microfiche catalogs for the National Slide Bank of the American Society of Hematology and have found this format inexpensive ($2.00 each for 150 copies of an 84-frame color microfiche card) and very high quality.

We plan to distribute these catalogs to other interested institutions around the country. Rather than loaning slides, which has proven expensive and cumbersome, we will make duplicate slides for any educational purpose (excluding publication). We will also accept slide donations from other institutions; however, these slides will be screened with our own for content and reproduction quality , and the patient consent will be evaluated for legality for inter-institutional loan.

Experience to Date:

We have kept a record of the subjects requested and search outcomes. We have been able to fill approximately 70% of the appropriate requests (i.e., for subjects within our scope). We have also kept a list of requests we were unable to fill. Items on this list reinforce our belief that a need exists for slides of common findings (e.g., diaper rash, rubella, insect bites). These subjects requested but not located have also been included in the "dream list" developed at the review meeting and circulated to clinical photographers and appropriate faculty.

We have several commercial catalogs (e.g., CIBA, Medcom) in the slide bank area and refer users to these other sources if they are interested. In addition, we have compiled a list of persons and departments at our university willing to share materials and have directed several requests to them.

Summary

Many departments at our university (and I believe at all medical schools and teaching hospitals) have very large collections of clinical photographs. As a rule, these slides have been gathered since the founding of the departments, arranged in some fashion which made sense to someone for a reason long since forgotten. Many times the photographic technique was poor to begin with and improper storage and handling (if anyone has ever used the slide) have compounded the problem! We are encouraged that word of our bank has stimulated considerable interest in tackling the problem of these collections. We are currently working on plans for off-shoot specialty banks with three departments. Although we can

apply or adapt several aspects of the Physical Diagnosis Slide Bank to these specialty areas, MeSH is always inadequate and we have been forced to search for other controlled vocabularies with greater depth in the particular field. In addition, the information on the unit record is different for each specialty, since each must reflect the unique retrieval needs of those users.

These are challenging, rewarding and often frustrating projects. We are eager for suggestions and comments.

PHOTO. CONTROL NO.	SLIDE BANK NO.

PHYSICAL DIAGNOSIS / CLINICAL MEDICINE SLIDE BANK

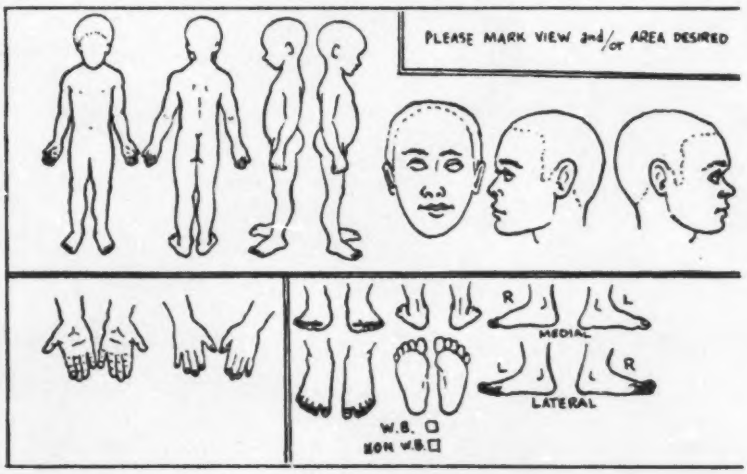
A Cooperative Project for the Development of Visual Teaching Material by
UNIVERSITY OF ARIZONA UNIVERSITY OF CALIFORNIA, SAN DIEGO
UNIVERSITY OF WASHINGTON

Patient name_____ Date_____

Address_____ City_____ State_____

Hospital control number_____

Requesting physician_____ Photographer_____



Special instructions:_____

List all disease states and pertinent diagnoses:_____

Cataloger's notes:_____

Figure 1A

PATIENT CONSENT FORM

The undersigned does hereby consent and authorize _____ to photograph (including the modification, or retouching thereof), publish, quote, or comment concerning myself (including the use of my name in connection therewith) and/or my medical case while under the care of the above institution, whether or not the same is in connection with the diagnosis, care, or treatment, including surgical procedures; and authorize and permit the use of such photographs, publication, quote or comment in such manner and at such times, and in such places as the above authorized hospital, individual or organization, without restriction and in its sole discretion, shall determine; and agree that such authorized hospital, individual, or organization may use or permit other persons to use the negatives, prints, republication, or other materials prepared from the foregoing for such purposes and in such manner as it, or they, may deem necessary, appropriate, or expedient; and agree that the original negatives, copyright, or other incident of ownership to such photographs, publication, quote or comment, whatever the media may be, including and not restricting newspaper, magazaine, journal, radio, television, brochure, book, lecture, movie, slides, videotape, is and shall remain the property of the above named hospital, individual, or organization, unless otherwise expressly stated to the contrary.

_____
Signature of husband or wife

_____
Witness

_____
Witness

_____
Signature of patient

_____
Signature of parents (if patient is a minor)

_____
Signature of legal guardian

Slide # UW-3-2 Dr: Goodell Date: 3-77

jaundice

sclera

liver cirrhosis

Figure 2

SLIDE SELECTION

Choose the way you wish to select slides. Enter the number of that choice and press RETURN.

1. By subject (s)
2. By number
3. By contributor
4. By slide type (X-ray, histopath, etc.)
5. By date of entry
6. Combinations of the above
7. Leave program

Figure 3

Subject Sorting

Enter the subject heading(s) that best describe the slides you want. Enter ONE heading per line, and press RETURN. Press RETURN one additional time to begin the computer search.

-- dermatitis

-- arm

--

Figure 4

11 slide sets found.

How would you like these slides listed?

1. Full description
2. Numbers only
3. Printed listing
4. No listing at all (start again)

Figure 5

Slide # UW-55-1 Dr: Smith Date: 3-77
arm
dermatitis, atopic

Slide # UW-56-1 Dr: Smith Date: 3-77
forearm
dermatitis, atopic

Slide # UW-57-1 Dr. Smith Date: 3-77
thorax
arm
dermatitis medicamentosa

Slide # UW-61-2 Dr: Smith Date: 3-77
arm
urticaria

Slide # UW-62-1 Dr: Smith Date: 3-77
hand
dermatitis, atopic

Slide # UW-155-1 Dr: Smith Date: 3-77
hand
dermatitis, atopic

Slide # UW-158-1 Dr: Smith Date: 3-77
arm
eczema

Slide # UW-208-2 Dr: Harnisch Date: 7-77
dermatitis, contact
arm
* poison oak dermatitis

Slide # UW-251-1 Dr: Larson Date: 10-77
dermatitis, atopic
arm

Slide # SD-106-1 Dr: Grundy Date: 10-77
eczema
arm

Slide # SD-107-1 Dr: Grundy Date: 10-77
hand
eczema

Figure 6